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ABSTRACT

The manual provides information about using learning centers in mainstreamed home economics classrooms. The initial chapter introduces the rationale for the approach and presents a three-stage model depicting an integrational approach to mainstreaming. Chapter 2 outlines typical characteristics and recommendations for accommodating students with physical disabilities (hearing, visual, speech, and motor impairments); cognitive disabilities (learning disabilities, mild mental retardation); and affective disabilities (emotional disturbances). Chapter 3 offers teaching/learning strategies to accompany decisions in classroom management plans. Chapter 4, on designing and using learning centers, includes a checklist summarizing the steps to be taken and a sample plan for a home economics learning center. A learning center model is illustrated by activities on energy and includes a learning center planning sheet, sample scripts and student evaluation forms, and directions for developing energy flash cards. (CL)

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LEARNING CENTERS:

A PERSONALIZED APPROACH TO MAINSTREAMING

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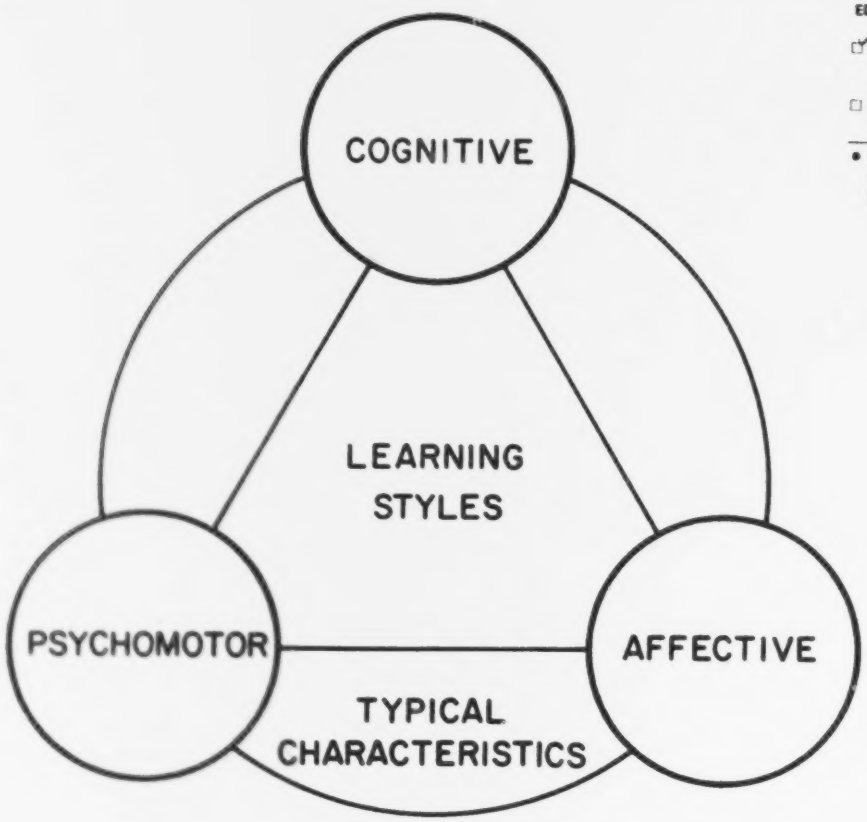

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Foreword

Whether the demands of teaching are viewed as opportunities or problems, they are not becoming fewer in the decade of the eighties. Social and economic conditions having impact on home economics education include controversy about some facets of family life education, dwindling resources to support education in general, effects of social change on individuals and families, and acceptance of the least restrictive environment concept. The last in the list is addressed by this publication. Home economics content includes knowledge and skills for independent living which makes these classes especially desirable for placement of learners with handicaps who are entitled to education in the least restrictive environment. It is not surprising, then, that the individualization and management skills required for the mainstreamed classroom are among the challenges for home economics educators.

The Home Economics Education Association is pleased to bring you this work by Betsy Babich *and Cecelia Thompson. Learning Centers—A Personalized Approach to Mainstreaming* is based on an integrational model of learners in a mainstreamed classroom that is a concise conceptualization of the authors' rationale for developing learning activities. Included are many recommendations for teacher adaptations to accommodate the increasing diversity of learners being educated together. The emphasis, however, is on learning centers and the authors present the hows and whys clearly and thoroughly.

As an example of a learning center suitable for the mainstreamed classroom, "Energy—In Search of Other Ways," is given in its entirety within the book. Babich and Thompson have illustrated the principles and procedures for learning centers with a very timely topic.

Learning Centers—A Personalized Approach to Mainstreaming is a worthy addition to the HEEA library of monographs. I urge you not to let it remain on the shelf, though. It's a publication to use, now.

Joanne B. Smith

President
1981-1983

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Introduction

Creating an environment for learning that supports emotional, social, and intellectual growth and is physically accessible to all learners continues to be a goal for which teachers strive. This becomes especially challenging when working with students having a variety of handicapping conditions. The situation intensifies when non-handicapped and handicapped learners are combined in a regular classroom setting. This practice of mainstreaming requires additional considerations in order to provide for responsible learning in a least restrictive environment.

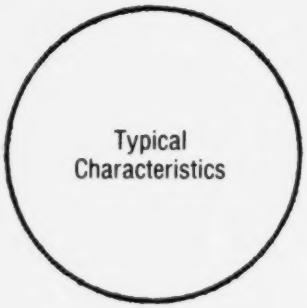
Learners can and should be responsible for the direction, mode, and pace of their learning. The personalized program of study, found in a learning center, permits the learners to direct their learning by selecting objectives and learning activities that take into consideration varied interests, learning rates, and handicapping conditions.

PART I An Integrational Model of Learners in a Mainstreamed Classroom

A learning center is a designated area of a classroom that contains a variety of instructional materials and activities organized around a specific theme, topic, concept, or skill. Several centers can be in operation in the classroom simultaneously. Learning centers offer the opportunity to provide multiple activities that can be decreased in number for the low cognitive learner, adapted for the physically handicapped, and increased in number and complexity for the average or gifted learner. Centers can organize and direct learning experiences and become vehicles for moving learners away from teacher dominated activities by providing opportunities to practice self-direction.

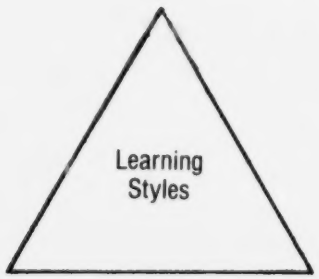
Another benefit of learning centers is to provide socialization experiences for the mainstreamed learner. One of the major reasons for mainstreaming handicapped learners into the regular classroom is to increase their contact with non-handicapped learners and decrease their isolation. Group learning within centers creates environments which encourage interpersonal processes as well as increased learning by the student. Centers also create supportive social networks for learners. Because learning centers contain a variety of activities ranging from simple to difficult and from concrete to abstract, they also enable a learner with a handicap to participate in interests shared by classmates.

The following model illustrates an integrational approach to mainstreaming. The first stage of the model represents the characteristics that all learners have in common. These characteristics are found in both handicapped and non-handicapped learners.



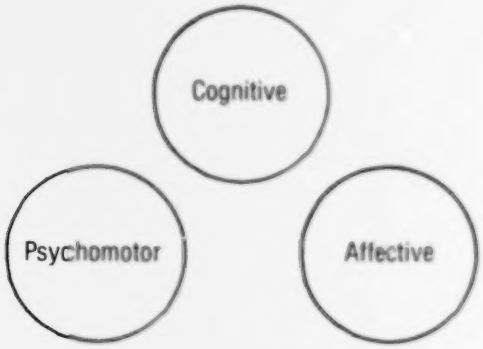
Stage I

The second stage of the model represents learning styles that are found in all learners to varying degrees.



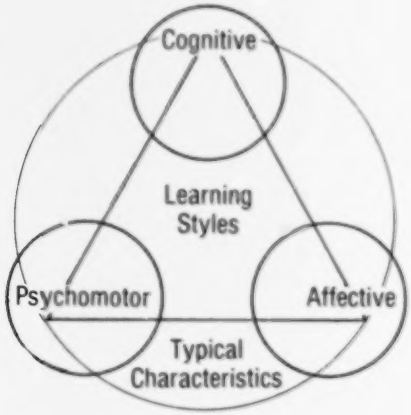
Stage II

The third stage of the model represents physical, cognitive, and affective handicapping conditions that are found in learners mainstreamed into the home economics classroom.



Stage III

The total model illustrates the necessity to consider the typical characteristics and learning styles of learners with a handicap as well as the characteristics common to particular disabilities when planning appropriate learning activities.



Stage IV

PART III Characteristics of Learners In a Mainstreamed Classroom

TYPICAL CHARACTERISTICS OF LEARNERS

Certain characteristics are generally true of home economics learners as a group. These characteristics are common to all learners, both with and without handicapping conditions. Individually, learners may show wide variations in relation to any one characteristic. However, beginning with needs and tasks that all learners experience will provide a basis for increased understanding of the complexities of students with handicapping conditions. The characteristics listed below are stated as they apply to observable behavior and include recommendations for classroom application.

Description	*Recommendations*
I. *Physical*	
1. Alternates between extremes of energy and fatigue. 2. Tends to have poor posture and clumsy, awkward movements. 3. Voices a wide variety of physical complaints. 4. May be careless and negligent about nutrition, rest, and health practices. 5. Is active, noisy, and boisterous. 6. Is concerned about sexuality, reproduction, and his/her own masculinity or femininity.	*Provide a variety of learning alternatives that include both physical and quiet activities. *Integrate nutrition and health information into all areas of home economics curriculum. *Allow for opportunities to understand physiological development and sexual roles.
II. *Emotional*	
1. Tends to be intolerant and critical of self and others, exaggerates imperfections. 2. May worry about concerns over which he/she has little or no control. 3. Is very sensitive to criticism, rejection, inadequacies, and failure; unsure of him/herself. 4. Is establishing own identity and independence. 5. Displays behaviors that are erratic and unpredictable; tends to go to extremes. 6. May spend much time "daydreaming." 7. Is competitive and highly motivated by tangible rewards and/or praise. 8. Is subject to wide mood variations and lacks emotional control. 9. Is highly self-conscious and feels him/herself to be "on display." 10. May be preoccupied with his/her own appearance and dress.	*Provide a continual source of positive reinforcement to *all* learners. *Incorporate opportunities to explore personal feelings and reactions. *Create a non-threatening classroom environment which allows for a variety of learner interactions. *Set explicit limits of behaviors to be tolerated and allow time and space for individuals to regain self control when limits are breached.

Description	*Recommendations*
III. *Social* 1. Conforms to peer standards and behavior. 2. Emulates behaviors of older or prestigious models. 3. Is easily influenced by ideas, beliefs, and tastes of others. 4. Tests his/her control and influence over others, sometimes cruelly. 5. Enjoys group activity and friendships, tending to form somewhat exclusive groups. 6. Places high priority upon status and approval from peers. 7. Needs to feel included.	*Provide opportunities to practice social skill development. *Encourage learner to participate in co-curricular activities, such as FHA. *Incorporate gaming and simulation into curriculum delivery. *Use small group-large group experiences. *Provide opportunities to examine a variety of viewpoints to encourage independent thinking.
IV. *Intellectual* 1. Engages in incidental learning.	*Provide easy access to a variety of resources to encourage in-depth learning. *Develop a classroom environment that exposes the learner to opportunities for learning within the community.

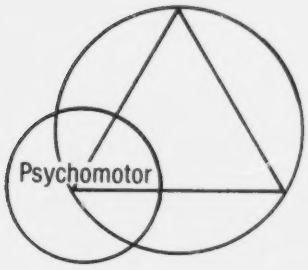
LEARNING STYLES

The following descriptions of learning styles can be found in all learners in varying degrees. However, learners have the tendency to fall more into one category than another. An awareness of these styles will help instructors (teachers) in providing appropriate learning activities. The chart below presents descriptions of seven broad categories of learning styles in the left column. In the right column specific recommendations for accomodating each learning style are presented.

Description	*Recommendations*
I. *Auditory Learner* 1. Learns best from hearing spoken words. 2. May remember locker and phone numbers, words to popular songs, and is quite successful with oral number games. 3. Memorizes quite easily. 4. Moves lips when reading silently or quietly vocalizes when studying. 5. Prefers oral expression.	*Allow time to talk through tasks. *Tape record lessons. *Tape record responses. *Pair with a visual learner in order to provide a balance.

Description	*Recommendations*
II. *Visual Learner* 1. Learns well from seeing words. 2. May write words down that are given orally in order to learn by seeing them on paper. 3. Remembers and uses information better if it has been read. 4. Generally does not require as much oral explanation. 5. Prefers written rather than oral expression.	*Provide opportunities to view and see instructions. *Allow for response to be written or pictorial. *Use pictures and a variety of visual aids. *Encourage development of listening skills.
III. *Kinesthetic Learner* (tactile) 1. Is full of activity. 2. Wants to touch-feel everything. 3. Enjoys doing things with hands and needs concrete objects as learning aids. 4. Has difficulty learning abstract symbols.	*Provide *active* learning experiences. *Provide opportunity for involvement through the use of role play. *Encourage positive channeling of activities. *Include opportunities to touch, feel, smell.
IV. *Auditory-Visual-Kinesthetic Combination* 1. Learns best by experience-doing, self-involvement. 2. Needs a combination of stimuli. 3. Needs manipulation of material combined with the accompanying sight and sounds.	*Encourage student to present demonstrations. *Provide opportunities to question, probe, and explore. *Allow a choice(s) in learning-reporting methods. *Provide for tape recording and script so learners can both listen and read.
V. *Individual Learner* 1. Accomplishes more work alone. 2. Thinks best and remembers more when learned alone. 3. Cares more for own opinions than for the ideas of others.	*Provide choice situations for individual, small group, and large group activities. *Encourage social and group interaction on a limited basis. *Encourage individual exploration of quest activities. *Provide an extensive supply of resource material.
VI. *Group Learner* 1. Accomplishes more when working with at least one other worker. 2. Values others opinions and preferences. 3. Increases learning and later recognition of facts through group interaction. 4. Needs opportunities to practice socialization skills.	*Provide for choice among individual, small group, and large group activities. *Encourage some independent work.

PHYSICAL DISABILITIES



Wide individual variations are found in the physically disabled. As a group, however, they are likely to exhibit the following characteristics:

*Has personal appearance that may indicate some physical limitations.
*Feels rejected by peers when judged by physical appearance.
*May or may not accept own disability, and possible appearance, as permanent.
*May be overly rejecting or overly demanding of help from others.
*Has difficulty in establishing one's self as an adult; difficult to attain society's "signs of maturity":
. . . marriage-parenthood
. . . economic independence
. . . independent living
*May be stronger or weaker physically than he/she appears to be.

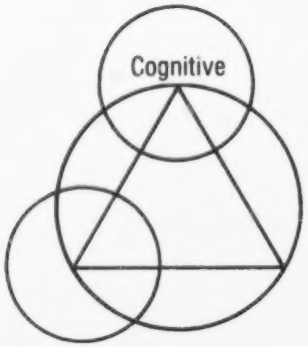
The following chart presents four specific physical disabilities and gives a description for each of these. The right hand column contains recommendations to accommodate for each physical disability described. Additional information concerning special needs of specific learners can be obtained from a counselor, phsyical therapist, or special education teacher.

Description	*Recommendations*
I. *Hearing Impairment* 1. May possess defective speech and language skills. 2. May not understand or may misinterpret spoken word. 3. Seems inattentive consistently. 4. Shows repeated inability to hear in a group. 5. Has difficulty in locating sound direction. 6. Frequently fails to respond to questions. 7. Asks to have words or sentences repeated. 8. Has an unusually loud or weak voice. 9. Withdraws from the group. 10. Complains of buzzing or ringing in the ears. 11. Has poor articulation. 12. Uses *what* frequently. 13. Frowns or strains forward when addressed. 14. Holds head in a peculiar position when spoken to or turns one ear to speaker.	*Use preferential seating. *Arrange for a "note-taker." *Allow the students to move freely about the room to secure the best vantage point for hearing. *Face the learner when talking. *Make the following adjustments for those individuals who lip read: a. provide good lighting b. allow seating close to the front of the room c. try not to stand in front of a window as this places shadow on your face and makes it impossible for the students to do any lip-reading d. spell new words on the blackboard e. when demonstrating the use of equipment, verbalize instructions before undertaking the demonstration, for students cannot watch the instructor's face and the demonstration at the same time f. avoid covering the mouth g. speak naturally h. repeat what others have said.

Description	*Recommendations*
	*Find out what acoustical conditions are detrimental to students who use hearing aids; if possible, close windows when there is loud traffic outside or close classroom doors when there is noise in the hall. *Check with the learners individually to see if they are comprehending the information and classroom presentation. *Make extensive use of written communication: a. use blackboards, overhead transparencies, etc. b. provide study sheet or discussion guide for the student to use during verbal discussions or lectures c. increase classroom and individual use of A-V materials d. When a cassette tape or record is used in class, provide the student with a script.
II. *Visual Impairment* 1. Rubs eyes excessively. 2. Blinks frequently and may become irritable when doing close work. 3. Has crossed eyes. 4. Stumbles or trips over small objects. 5. Is unable to participate in games requiring distance vision. 6. Writes erratically. 7. Complains of dizziness, headaches, or nausea following close eye work. 8. Appears awkward, clumsy, careless. 9. Tilts head. 10. Holds objects close to eyes. 11. Squints and rolls eyes. 12. Is sensitive to bright lights. 13. Is inattentive to visual objects or tasks such as looking at pictures. 14. Displays awkwardness in activities requiring hand-eye coordination. 15. Avoids tasks requiring close eye work.	*Convert printed instructional material into enlarged print. *Transcribe pertinent material onto cassette tapes. *Provide special or supplementary lighting for visually impaired students. *Stress auditory models of presentation. *Make extensive use of records and tapes.
III. *Speech Impairment* 1. Does not speak distinctly and lacks sufficient volume to be heard. 2. Tries hard, but no sound comes out. 3. Blinks eyes excessively or engages in other bodily motions while talking. 4. Lisps. 5. Omits sounds from words, adds to words, distorts words, and substitutes one letter for another.	*Find ways to have the child talk. *Encourage the child to talk even if he/she has difficulty. *Call on the child at the beginning of the class since waiting seems to generate anxiety. *Excuse the child from speaking if he/she is having an unusual amount of difficulty one day.

Description	*Recommendations*
IV. *Motor Impairment* 1. Has defects which interfere with normal functioning of the bones, muscles, or joints. 2. Has limited self-mobility. 3. Has personal appearance that may indicate some physical limitation. 4. Feels rejected by peers when judged by physical appearance. 5. May or may not accept own disability, and possible appearance, as permanent. 6. May be overly rejecting or overly demanding of help from others. 7. May be stronger or weaker physically than he/she appears to be.	*Allow learner with manipulative impairments ample time to complete task involving manual dexterity. *Demonstrate a procedure, then let the learner do it. Don't be overly concerned if the learner makes a mistake; convert that mistake into a learning experience. *Permit a learner for whom transporting books and supplies is a burden to have a duplicate set of textbooks or other supplies, one to be stored in the classroom and the other kept at home. *Modify laboratory equipment and facilities in the following ways: a. remove obstructions and provide ample space between aisles and around equipment b. alter the level of the work area c. use table rather than counter in food preparation d. use extension cords on some equipment so it can be used away from the counter in foods labs e. provide simple cabinet handles (rather than knobs) for amputees with prostheses f. use mobile demonstration units that can be moved from learner to learner g. provide outlets, faucets, and other controls mounted toward the front and side of the work station (rather than mounted at the rear) h. mount cutting board on suction cups so that learners with minimal strength will not have to hold the board steady i. provide peeling screw to hold vegetables to be peeled j. provide electric scissors for students with minimal motor control k. provide grocer's hook for reaching items l. place a lightweight sewing machine on a tray fitted over the arms of a wheelchair.

COGNITIVE DISABILITIES

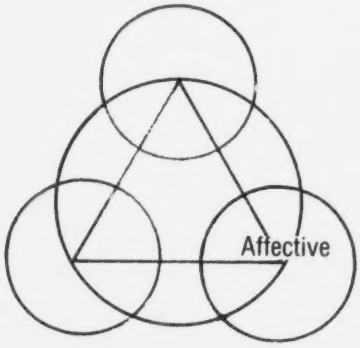


As is true for home economics learners as individuals, home economics cognitive disabled learners exhibit wide variations from individual to individual. However, the following characteristics are more likely to be found in the disabled as a group than in the general population. In order to provide effective learning for cognitive disabled learners, school specialists and resource people such as the special education teacher should be contacted for additional information. The following chart provides a description of three cognitive handicapping conditions that are most prevalent in a mainstreamed classroom. Recommendations for classroom use are offered in the right hand column.

Description	*Recommendations*
I. *Learning Disabled* 1. Reverses letters in reading and writing. 2. Has poor printing and writing. 3. Reads word by word. 4. Displays inability to keep place during reading. 5. Frequently mispronounces beginnings or endings of words. 6. Has difficulty comprehending differences between speech sounds. 7. Has short attention span and is easily distracted. 8. Exhibits difficulty in organizing ideas and concepts.	*Prepare an outline of the lesson and give it to the learner before class. *Supply a glossary of technical terms essential for the courses. *Provide study papers with assignments. *Help develop skills by indicating what material is important and what can be skimmed over.
II. *Slow Learner* 1. Functions at a lower intellectual level than peers. 2. Has a potential for learning basic academic information, but at a slower rate. 3. Has the capacity for social adjustment and partial or total self-support as an adult.	*Use texts with varying reading levels. *Simplify work or projects. *Keep words and sentences as simple and as short as possible. *Include as many visuals as possible: drawings, pictures, illustrations. *Use other learners to help a slow learner keep up with the class. *Teach through repetition. *Include more demonstration in class presentation. *Include more "hands-on" experiences or actual life-like experiences. *Allow extra time for completion of tasks. *Arrange for similar but not as complicated lab experiences. *Read tests to them.

Description	*Recommendations*
	*Teach in a step-by-step manner. *Guide slow learning learners to select an appropriate project to assure their success. *Tape record some information that would otherwise need to be read.
III. *Mildly-Mentally Disabled* 1. Has learning curve similar but slower than the normal child. 2. Lags behind classmates 1½ to 3 years in basic skills. 3. Develops at ½ to ¾ the rate of the average child. 4. Performs better in oral than written testing situations. 5. Is limited in generalizing ability. 6. Transfers concrete learnings with help. 7. Retains knowledge that has been overlearned. 8. Possesses limited power of concentration for long periods of time. 9. Has limited ability to use power of concentration for long periods of time. 10. Is primarily concerned with "here and now." 11. Lacks inner motivation; is outer motivated. 12. Is limited in judgement and decision making ability. 13. Does not find repetitious or monotonous tasks distasteful. 14. Has difficulty in attacking, analyzing, and solving problems. 15. Is limited in ability to think and reason abstractly.	*Plan concise learning periods in which one or two objectives are met. *Sequence learning so that learning moves from concrete to abstract and from simple to complex. *Demonstrate activities rather than explaining them. *Provide opportunities to improve language and communication skills. *Offer a continued source of praise and encouragement. *Use as few words as possible when giving oral directions. *Incorporate visual aids that can be used on an individual basis to encourage independent work.

Affective Disabilities



There is variation from individual to individual; however, affective disabled learners display patterns of behavior such as withdrawal, disruptions, and antisocial characteristics. In order to plan effective learning experiences, it is helpful to seek information from a counselor, social worker, psychologist, doctor, or other specialists. The chart below identifies characteristics of an emotionally disturbed learner and offers some recommendations for remediation.

Description	***Recommendations***
I. *Emotionally Disturbed* 1. Is usually intense (anxious, frowning). 2. May become easily frustrated. 3. Is overly sensitive to criticism and has a negative self-image. 4. Appears shaky and nervous, explosive. 5. Demands attention. 6. Is overly self-critical. 7. Imagines peer and/or teacher persecution. 8. Disrupts classroom repeatedly. 9. Does not participate in any activities. 10. Behaves inappropriately or immaturely under normal conditions. 11. Is unable to evaluate personal behavior in terms of the consequences it has for others or self. 12. Appears extremely and frequently unhappy and depressed. 13. Often reacts unacceptably to life situations. 14. Exhibits nervous mannerisms (crying, nail biting, etc.). 15. Is overly anxious to get approval of others. 16. Shows marked degree of fear, apprehension and is easily hurt. 17. Appears moody, depressed, suspicious, and seclusive.	*Provide individual attention. *Decrease pressure in classroom. *Develop personal relationship with student. *Make atmosphere comfortable and pleasant. *Provide a continual course of positive reinforcement for desirable behavior.

PART III Classroom Management Techniques For Use With Learning Centers

Classroom management is the process chosen by the teacher to plan activities and keep records efficiently. It should also permit maximum personalization and self-direction for the learners with minimum interruption to both the learners and the overall classroom program. A plan for classroom management answers the following questions:

1) What are the learning activities the learner can do?
2) When will the learner be involved in the learning activities?
3) Where will the learner do these activities?
4) How will records be kept and used for evaluation?

Mainstreamed classes are particularly challenging to teachers' classroom management techniques. The chart listed below was developed to identify critical management elements for such classes. The left hand column identifies a four-step classroom management plan stated in question form. The middle column states where to look for answers to the classroom management plan. The right hand column offers teaching/learning strategies to accompany each step in the management plan.

DECISIONS ABOUT	DETERMINED BY	EXPLORING
1. *What* are the learning activities the learner can do?	Learner objectives Objectives of the learning experience Learner's preferred style(s)	Provide for multiple choice of activities to accommodate learning styles and handicapping conditions: • reading • viewing • exploration • questioning • listening • manipulating
2. *When* will the learner be involved in these learning activities?	Objectives Learning alternatives Results of diagnosis of learners "Fixed" activities in the school day (e.g., special classes, library periods) Space available for learning centers, group work, and individual work Materials available Length of time required to complete activities, tasks, experiments	Sequence learning centers, but allow for flexibility in individual learners: • contract system • training plan • flow chart Allow last 5-10 minutes of class time for group discussion and follow up Organize specific time for small group work: • sign-up sheet • presentation of demonstration Limit number of people using a center at a given time
3. *Where* will the learner do activities?	Some activities are best accomplished at school and others at home or in the community	Organize room into areas: • testing area • quiet study area • activity area • materials area

4. *How* will progress records be kept and used for learning evaluation?	Learner maintained records Teacher maintained records Methods employed in record keeping Means of reporting progress	Progress records: • bulletin board indicating progress of each student • weekly journals • daily logs • progress card for each student • file folder for each student Determine individual learning goals for each student within a given time frame: • periodic conference • re-evaluate learning goals as necessary • "in-out" basket • provide concise directions in each center for reporting progress

PART IV Designing and Using Learning Centers

Once the decision has been made to incorporate learning centers as a part of the teaching/learning strategies, the next step is to design the center. There are several items that will aid this process, thus contributing to the overall effectiveness of the center.

First, determine the educational mission or purpose to be achieved. This will lend direction as to the type of center chosen. An appropriate question to ask is: Does the educational mission support an enrichment center, skill center, interest center, a center to present new information, or a center to reinforce material already presented?

After the educational mission and type of center have been decided upon, the next step is to specify the objectives. It is important to consider not only the behavior and content to be learned, but also the abilities and interests of the learners. The center should be able to challenge the advanced learner as well as provide success and accomplishment for slower learners.

The educational mission and statement of objectives give direction to the selection of learning activities. Alternatives that support a variety of learning styles need to be offered. They should be clearly stated, and consistent with the purpose and objectives. A means should be provided for turning in work accomplished and all instructional materials should be located at the center station.

The instructions for student use of the center is the next task to be accomplished. Essential elements to be considered are the number of students able to use the center at one time, the conditions under which the center may be used, and the availability of the instruction to all learners regardless of handicapping condition. Instructions for student assessment procedure (pretests, self-evaluations, posttests) need to be clearly stated.

The fifth and sixth steps of the design process, choosing the space and securing furniture and materials, require much thought if the center is to effectively serve the mainstreamed classroom. If multiple centers are used, they must be planned and organized so they do not conflict or compete with each other. The furniture and materials selected, the placement of the center(s), and the general room arrangement must provide a least restrictive environment for all learners.

The management system devised for use with the learning center approach is the key to success. The system should maximize learner self-management and ease the record keeping for the teacher. It should be compatible with the evaluation philosophy of the school, provide for teacher-learner conferences concerning progress, and be easily understood by learners. When an effective management plan is used, the teacher—rather than the system—becomes the director of the learning process.

After the center is carefully planned, instructions provided for, and a management system devised, the next steps are to set up the center and orient the learners to the center. Learners using the center must be well informed about the purposes, procedures, and management of the center. They need to understand how this center relates to other instructional activities in the classroom. If the orientation process is omitted or not carefully attended to, frustration may result.

The final step is the evaluation process. This provides for both teacher and learner feedback, and a time for reflective thought concerning needed changes or additions. Of course this step becomes ineffective if action does not result from the evaluation process.

The checklist that follows summarizes the steps involved in creating and using a learning center. It is designed to be used as a guide for planning and evaluating learning centers. A sample plan is also included illustrating the planning steps undertaken for one learning center. These two guides are offered as organizational tools in the planning and using of learning centers in a mainstreamed classroom.

Checklist for Creating and Using a Learning Center

Yes	*No*	
		1. Examine the educational mission and decide upon the type of center.
____	____	a. Is a classroom learning center appropriate to the educational mission or purpose? Is some other individualized approach more appropriate?
____	____	b. Is the center appropriate to the stated mission or purpose?
____	____	c. Is the type of center chosen appropriate to the educational mission (skill center, enrichment center, interest center)?
		2. Specify objectives.
____	____	a. Do the objectives relate to the overall classroom curriculum and instruction plan?
____	____	b. Can the objectives be accomplished in the center?
____	____	c. Do the objectives relate to the abilities and interests of the learners?
____	____	d. Are alternatives available for communicating objectives to learners; e.g., posters, objective cards?
		3. Design learning activities.
____	____	a. Are the alternatives consistent with the purpose or objectives of the center?
		b. Are the alternatives explained in such a way that the student knows:
____	____	(1) what to do?
____	____	(2) where to find information and what media to use?
____	____	(3) what to do with results or products from the alternatives?
____	____	c. Is there a wide assortment of alternatives to accommodate varying abilities, learning styles, and interests?
____	____	d. Does the center include various media and materials (e.g., games, books, filmstrips, construction activities) to accommodate the intent of the learning alternatives?
____	____	e. Are the alternatives written on task or activity cards and made easily accessible to students?
		4. Write instructions for students use of center.
____	____	a. Has the number of learners able to use the center at one time been determined?
____	____	b. Do learners understand when they can use the center?
____	____	c. Are objectives for each learning alternatives clear to learners?
____	____	d. Are all needed instructions for learning alternatives available to learners?
____	____	e. Are assessment procedures (including self-tests when appropriate) clearly established and available to learners?
____	____	f. Are instructions clear as to what learners do with products or assignments completed in the center?
		5. Choose the optimum space and decide upon a design for the center.
____	____	a. Is adequate space available for the center?
____	____	b. Is this the only classroom center or will there be others?
____	____	c. Has the physical development of the learners been considered in the space allocations?
____	____	d. Are the kinds of furniture and equipment used in the center appropriate for all learners?
____	____	e. Does furniture and equipment for the center contribute to effective use of space?
____	____	f. Will the location of the center interfere with other classroom activities?
____	____	g. Are any special environmental conditions provided for, e.g., plants need to be near windows or refrigerator for food storage?

Yes	*No*	
		6. Secure needed furniture and materials.
____	____	a. Has furniture and equipment needed been identified?
____	____	b. Is furniture and equipment available in the classroom? School? School system?
____	____	c. Are there other local sources for obtaining furniture and equipment?
____	____	d. Can learners contribute, lend, or make necessary furniture and equipment?
____	____	e. Have instructional materials been identified?
____	____	f. Are the materials available in the school system?
____	____	g. Have other sources besides the school system been contacted to obtain free and inexpensive materials?
____	____	h. Can learners contribute or solicit free and inexpensive instructional materials?
		7. Devise a management system.
____	____	a. Have alternative management systems for a center been considered?
____	____	b. Are there special requirements or materials needed for the system?
____	____	c. Is the management system appropriate for the age and ability levels of the learners for self-management activities?
____	____	d. Does the sytem maximize learner self-management and ease of record keeping for the teacher?
____	____	e. Is the management system compatible with the evaluation philosophy of the school?
____	____	f. Have arrangements been made for the teacher and learner to consult about student progress and evaluation?
____	____	g. Are scheduling procedures for use of the center easily understood?
		8. Set up the center.
____	____	a. Are all materials, furniture, equipment, and other necessary accessories available for the center?
____	____	b. Has a date or time line been established for the assembling of the learning center?
		9. Orient learners to the center.
____	____	a. Are learners well informed about purposes, procedures, and management of the center?
____	____	b. Do learners understand the relation of the center to other instructional activities in the classroom?
		10. Evaluation of the learning center.
____	____	a. Does the name of the center attract interest?
____	____	b. Are the objective(s) clearly stated?
____	____	c. Is the learning sequence easily understood?
____	____	d. Are the instructions clearly stated and easy to read?
____	____	e. Are the self-help materials available or easily obtained?
____	____	f. Is any equipment needed easily available?
____	____	g. Do the learning experiences actively involve the learner?
____	____	h. Are choices in learning experiences provided?
____	____	i. Is immediate feedback possible?
____	____	j. Are opportunities provided for students to evaluate the learning center?

A Sample Plan of a Home Economics Learning Center

1. Select a topic or area

   Example: Teenage Living Class
   Energy Conservation

2. Decide on level

   Example: Seventh and/or Eighth Grade
   Appropriate for Use by Mainstreamed Learner

3. Determine the skill or concept to be taught, reinforced, or enriched

   Example: To Become Aware of the Need to Conserve Energy

4. Select a title

   Example: The Energy Crisis and You
   or
   Take Action on Energy Conservation

5. Develop the concept or skill into Objective(s)

   Example: Students will develop a belief in personal application of conservation practices

6. Incorporate the objective(s) into a variety of learning experiences appropriate to multiple learning styles and handicapping conditions

   Example: (a) Use reference materials to find when experts predict we will run out of such forms of energy as coal, oil, and natural gas,
   (b) Listen to the tape recording of the above material,
   (c) Interview some experts in the field of energy to determine above material

7. Organize the activities into a learning center plan

   Example: (a) Materials and procedures for construction
   (b) Sketch of display area

8. Evaluate learning center

   Example: (Learner Evaluation)

   Place a circle around the face that best describes your reaction to the learning center.

   (a) The thing that I liked best about the learning center is

   (b) The thing I liked least about the learning center is

   (c) Another way that I could have learned the material in this center is

PART V A Learning Center Model

The following illustration of a learning center is one example of a learning center that can be used in a mainstreamed classroom. Although the topic of the learning center is timely, the purpose of this example is not subject matter oriented. Rather, the purpose is to illustrate the organizational steps, design procedures, and construction process involved in creating a learning center. Remember it is not always necessary to create new instructional materials when using the learning center approach. Many times it is possible to adapt conventional lesson plans to this teaching strategy.

The learning center presented here, "Energy . . . In Search of Other Ways" is adapted for the handicapped learner, and designed to provide multiple learning activities appropriate for various cognitive levels and/or handicapping conditions. It is a complete package, ready for classroom adaptation. All of the planning steps, student handouts, scripts for tape recordings, and directions for learning center station construction have been included on the following pages. A chart of the actual learning center appears on page 27 and it may be helpful to refer to this chart as each component is presented. In order to provide for accurate student assessment, the final test, called the Pass-Review (see page 37), should not be placed at the learning center station. The teacher should distribute this as needed.

Learning Center Planning Sheet

1. *Topic or Area*

   The topic for this learning center is energy conservation. It has been developed for home economics classrooms.

2. *Level/Function Within Classroom*

   This learning center is for junior high students—grades 7 or 8. It may be used as an independent study or small group study within the classroom.

3. *Title*

   Energy . . . In Search of Other Ways.

4. *Goal*

   To encourage students to conserve energy and to help others become aware of the need to conserve energy.

5. *Objective(s)*

   By the completion of the learning center, the learner will have the opportunity to:

   I. *Identify* sources of energy alternatives.
   II. *Plan* methods of energy conservation.
   III. *Develop* belief in the value of personal application of conservation practices.

6. *Learning Activities*

   Objective I: Identify sources of energy alternatives (see p. , quest 2)

   Quest 1

   Choose one activity from 1-3

   1. Listen to the Energy Quotient recording.
   2. Read information in the Energy Quotient booklet.
   3. Listen to the tape and follow along in the Energy Quotient booklet

   Choose one activity from 4 or 5

   4. Complete the E. Q. sheet individually or with your learning center group.
   5. Complete the E. Q. tape. Work with the teacher or classroom resource person.

Quest 2 (see p.27 , quest 2)

Choose as many of the remaining activities as you need in order to reach Objective I.

6. Contact by letter or phone the local power authority to determine what sources of energy are used to generate power for your community. You may present your information by preparing a written or oral paper.
7. Construct a chart showing energy uses in the home. You may wish to refer to the booklet or tape for information.
8. Visit your library or resource room to investigate further the sources of any of the energy source alternatives listed in the booklet or tape.
9. Look at the enclosed sheet showing the Spark's home and circle each source of energy consumption you see. Determine the approximate cost of their monthly bill for energy use.

Objective II: Identify methods of energy conservation.

Quest 3 (see p.27 , quest 3)

Choose one activity from 1-3

1. Listen to the Energy Conservation recording.
2. Read the information in the Energy Conservation booklet.
3. Listen to the recording and follow along in the Energy Conservation booklet.

Chose one activity from 4 or 5

4. Complete the Energy Conservation sheet individually or with your learning center group.
5. Complete the Energy Conservation tape. Work with your teacher or the classroom resource person.

Quest 4 (see p.27 , quest 4)

Choose as many of the remaining activities as you need in order to complete Objective II.

6. Identify ways the Sparks could conserve energy. You may present your information in an oral or written report.
7. Write your own energy conservation pamphlet. You may wish to illustrate your pamphlet with pictures you draw or pictures cut from a magazine.
8. Conduct a survey by interviewing people about one topic of energy conservation. You may tape their responses or list them on a chart.

   Some examples include: How many minutes do you stay in the shower? What temperature do you keep your thermostat? How many trips does your family make to the grocery store each week?
9. Contact auto dealers in your community to determine the mileage of several different makes and models of cars. Use the following chart to record your responses. Use the mileage chart provided to record your answers.

   Make:
   Model:
   Year:
   Est. MPG:
   Type of gas used:
   Cost of gas:
   Expense of gasoline for driving this car 100 miles:

Objective III: Develop a value position regarding personal application of conservation practices.

Quest 5 (see p. 27, quest 5)

Choose as many activities as you need to complete Objective III and write your choices on the contract. Make two copies—one for you and one for your teacher.

1. Write a letter to the editor of your school or community newspaper expressing your beliefs about the wise use of energy and what can be done by one individual to conserve energy.
2. Write an article for your school or community newspaper expressing your beliefs about the wise use of energy and what can be done by members of your community to conserve energy.
3. Prepare a community service announcement explaining one way to conserve energy. Tape record your announcement and submit it to a radio station.
4. Make posters or bulletin boards to display around school showing ways teenagers can conserve energy.
5. Prepare a flyer on ways of conserving energy in the home to be distributed by members of your class in the community.

6. Another way that I can demonstrate my belief in energy conservation is _____

_____.

Quest 6 (see p. 27, quest 6)

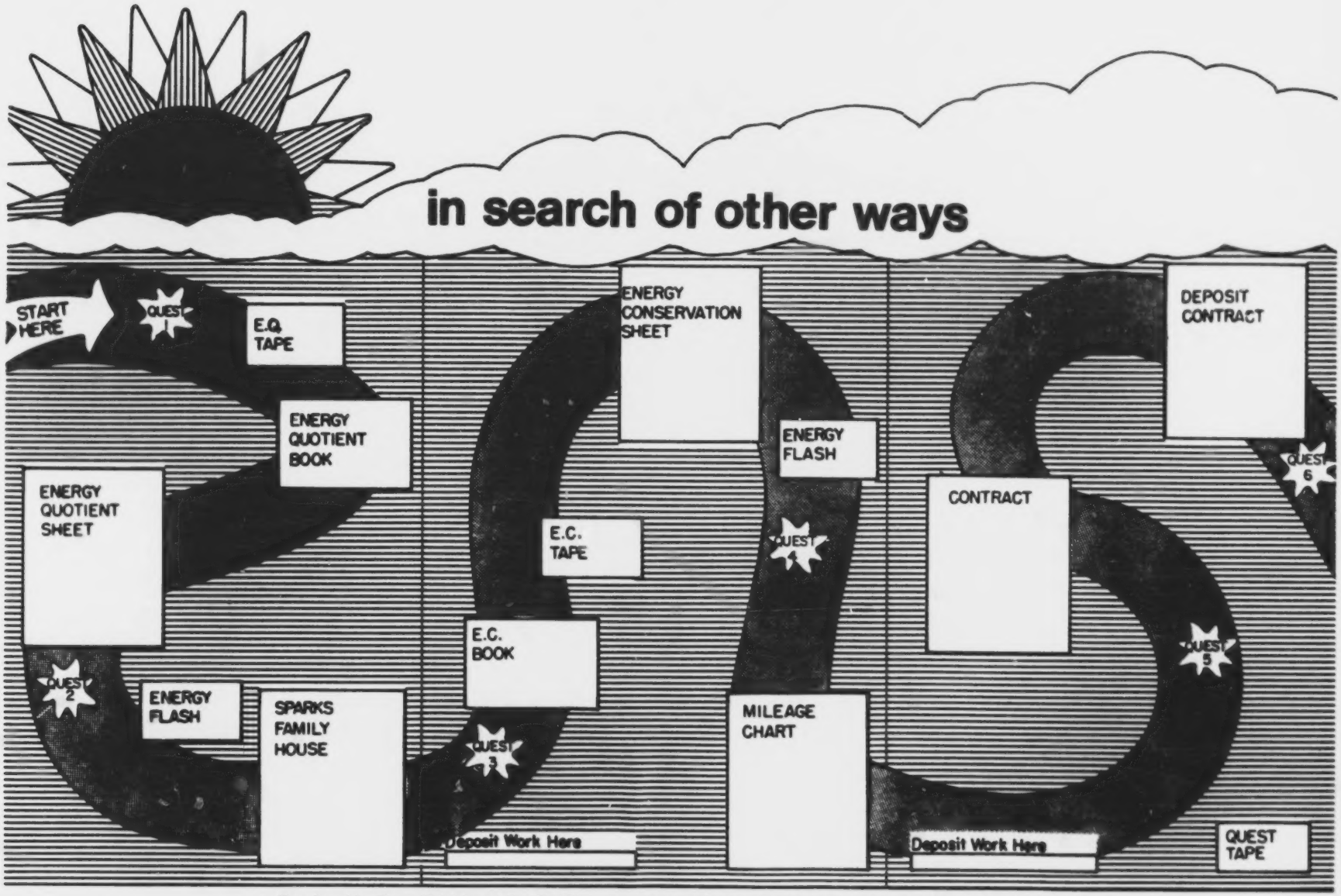
When you have completed all of your activities and feel you have reached the objectives, ask your teacher for the pass-review.

7. *Directions for construction of learning center* (see p. 31)

Materials:
1—9 x 4 foot foam core board or plywood
1 quart enamel paint for background
additional paint for lettering, boxes, pathway, sun and clouds
6—8½ x 11 inch boxes for activity sheets
4—4 x 6 inch boxes for tapes and energy flash cards
2—6 x 8 inch boxes for booklets

Procedure
1. Cut sun and cloud designs into the top of the board
2. Divide the board into three panels and hinge
3. Paint background color, sun, and clouds
4. Sketch on pathway and mark position of boxes
5. Letter title on board
6. Paint pathway on board
7. Paint and label boxes
8. Attach boxes to board
9. Cut slots for depositing finished work
10. Letter Quest instructions on board

See the attached materials for information to be included in the tape recordings, booklets, and handouts.



Developed by Betsy Babich and Cecelia Thompson. Project No. 94-1001; The Pennsylvania State University.

SCRIPT FOR ENERGY QUOTIENT BOOKLET AND TAPE

(For placement in the learning center; see page 27)

Have you ever thought about the cost of washing your favorite pair of jeans and shirt—or of taking a long leisurely shower and washing your hair to get ready for that important date? How much water is used and what is the cost of heating that water? Separately, these activities may not cost too much, but consider the cost of other conveniences that we take for granted in our homes today—the cost of running our refrigerators to keep our food safe and cold, the cost of being comfortable in air conditioned rooms, the cost of looking nice when we use hair dryers, electric curlers, irons.

In order to understand the costs of energy use, it is helpful to become aware of the sources of energy available. This tape will explain what the various sources of energy are and how much energy is used by different household items.

Energy consumption in the United States has doubled since 1950. The United States contains about 6% of the world's population and uses about 33% of the world's energy. Currently about 50% of all energy consumed in the U.S. is for transportation.

Where does all this energy come from? There are four major forms of energy. These are oil, natural gas, coal, and nuclear. Other contributing sources are water, solar, wind, geothermal, trash, and chemicals such as hydrogen.

Let's take a closer look at each one of these sources. Oil formation is from deposits of plant and animal life some 300 million years ago. Over time pressure from the earth's surface changed this into oil. Oil is found in veins of porous rock. Limestone, sandstone, and beds of sand are examples of the rock in which oil is found. Resources of oil will last from 40-70 years at the present consumption rate and 20 years if we rely on only U.S. resources.

Natural gas is also found in underground reserves. During 1973 this country used approximately 23 trillion cubic feet of gas—2½ times the amount used 10 years earlier. At this rate the power reserves will last only about 13 years.

Coal is formed from fossilized remains of trees and the heavy vegetation that lived millions of years ago. It takes 1000 years to form a one foot layer of coal. Pollution arising from burning coal is still a major economic and environmental problem. There is a 250-300 year supply of coal in the United States.

Nuclear energy comes from two sources. The first one is atomic energy from nuclear fission . . . not fishing!! This is the process of splitting atoms apart. The amount of heat and energy released from nuclear fission is 20,000 times greater than from an equivalent amount of coal. Currently there is a question of safety due to long lasting radioactivity of the atomic waste.

The second type of nuclear energy is nuclear fusion, or the fusing together of atoms. There is an unlimited energy supply of this type but the process is difficult to control. It requires extreme pressure and temperature as high as 100 million degrees Farenheit. Because of these factors much research is still required before it can be readily available for home use.

There are five more alternate sources of energy that should be considered. The first one is solar energy. This energy alternative uses heat energy from the sun and converts it to a useable form. If this energy was converted to useable power, solar radiation alone could meet all our energy needs. There is a large expense in the installation of heat collectors, but it is certainly a source requiring our immediate attention.

Another energy alternative is geothermal energy. This is power from heated rocks or molten magma in the interior of the earth, usually transferred to the surface as heated water or steam. It is estimated that the heat in the top 10 miles of the earth's crust is equivalent to 2000 times the amount of heat potential from the earth's total resources of coal. Much of this energy is impractical to reach.

The third energy alternative is wind and water power. The first acquaintance that we had of this type of energy was the windmill. It is still the major source of creating energy through the use of wind. This was an inefficient source but some newer models of windmills are beginning to appear on the market, and are deserving of our attention.

Water power is not a reliable source and is difficult to control. The costs of building and maintaining dams and reservoirs are high. There is a tendency to have irregular supplies of water and it also requires agricultural land to be flooded which causes damage to the environment.

Energy created from waste, trash, and sewage sludge is another energy alternative. This can be used to supplement fossil fuel, but reliable ways of harnessing this energy form have not been developed.

The fifth and final energy alternative to be considered here is the use of chemicals. The chemical most often used is hydrogen. Hydrogen is burned as a gas and there is an inexhaustible supply of this source from the sea. Again, more research is needed in order to make this into an energy form readily useable in the home.

Taking energy from its natural form to one that can have direct use in our homes is no easy task. There are many technological procedures necessary to convert a natural source of energy into electricity for your home. Each procedure adds to the cost of the energy converted for home use. The next time you turn on the clothes dryer remember that it is costing you about $6.00 in electrical power a month to run.

Different customers use energy differently. The following information concerning the costs of energy are based on average use of typical appliances. They should give you a basis for estimating how much the use of these items costs you. They are based on monthly electrical costs.

range—for a family of four	5.30	lighting for an eight-room house	4.24
refrigerator	10.60	hot water heater	5.83
freezer	7.95	clothes dryer	5.94
		washer	.48
oil burner	2.65		
furnace fan or circulator	3.98	dishwasher	1.50
room air conditioners	31.80	microwave oven	1.50
house heater	33.00	toaster	.16
television, color	2.01		
radio (four hours a day)	.42		

Individually, these appliances do not seem to use much electricity, but try adding up the costs of an average usage for one month and see what the total is.

Adapted from: Howell, D. L. *Energy Conservation in the Home and on the Farm.* Teacher Education Series, Vol. 19, No. 4: Penn State University, 1978.

Name _____

Energy Quotient Sheet (for placement in the learning center; see page 27)

Test Your E.Q.*

Take this quiz to check your knowledge and understanding of energy-environment issues. When you have marked your answers, check with your teacher for the answer sheet.

1. What fraction of the world's energy consumption occurs in the U.S.?

   a. over 1/10
   b. over 1/3
   c. over 1/2

2. Which of the following consumes the most energy?

   a. household usage
   b. industry
   c. transportation

3. Identify the four major forms of energy in use in the world.

   a.

   b.

   c.

   d.

4. Which of the following fuel resources is in greatest danger of exhaustion?

   a. coal
   b. petroleum
   c. natural gas

5. A major economic and environmental problem in the burning of coal is _____

   _____ .

6. If solar radiation was converted to usable power, it could meet what part of our energy needs?

   a. a small part
   b. about half
   c. all

7. How is geothermal energy created?

8. What was the first type of wind power we became acquainted with in the U.S.?

9. In addition to solar, geothermal, and wind power, what other energy alternatives exist?

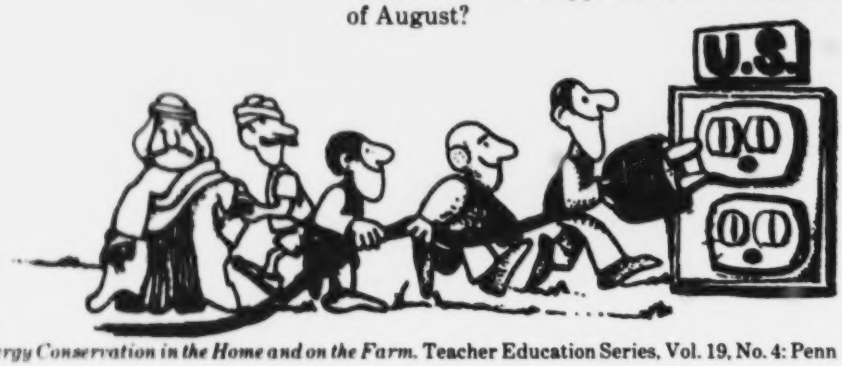
   a.

   b.

   c.

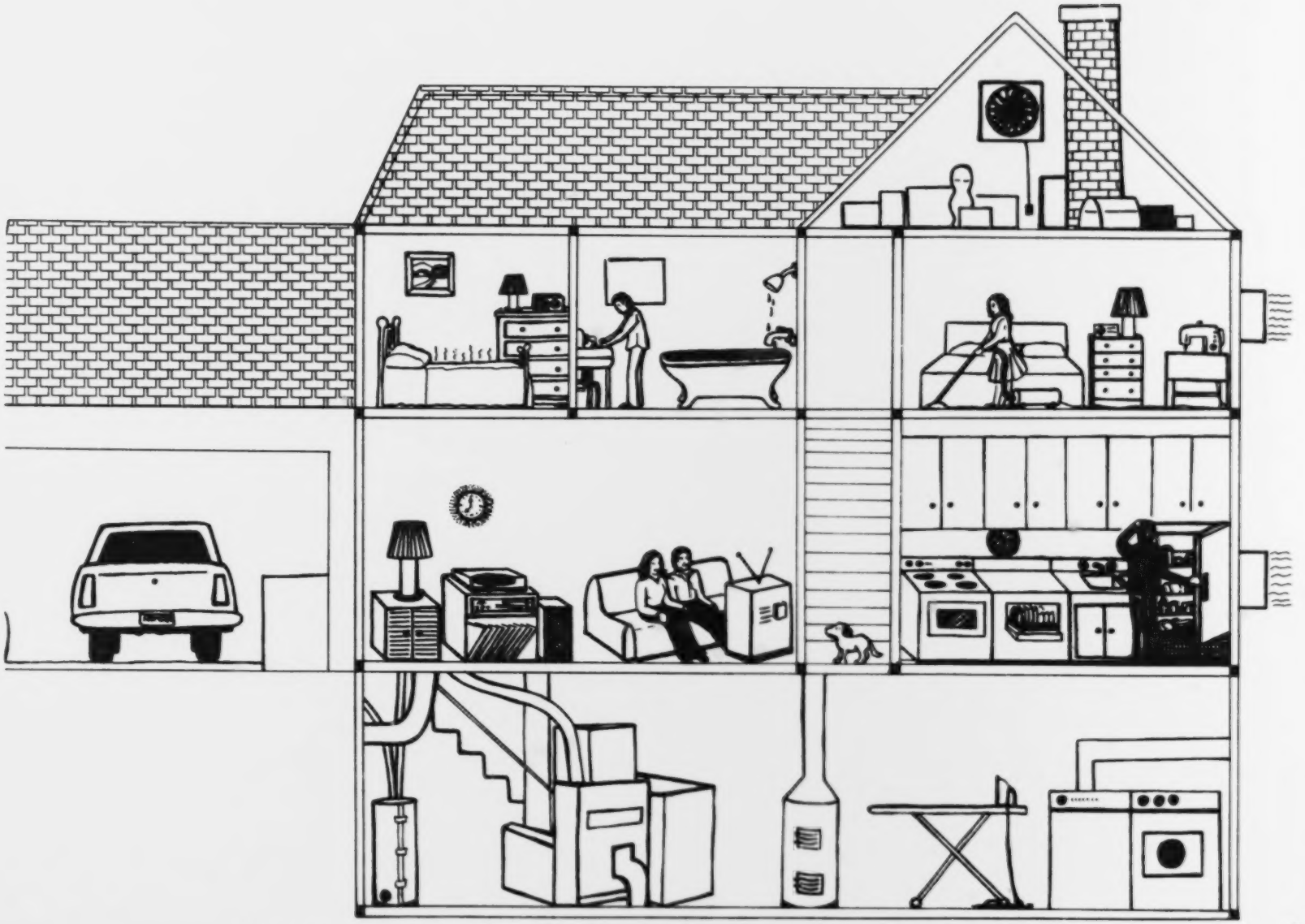
10. In the month of August, you watched television every night, ran the air conditioner, kept snacks in the refrigerator, and warmed them in the microwave oven. How much did it cost to use these appliances for the month of August?

*energy quotient



Adapted from: Howell, D.L. *Energy Conservation in the Home and on the Farm.* Teacher Education Series, Vol. 19, No. 4: Penn State University, 1978.

Sparks Family House (for placement in the learning center; see page 27)



Developed by Betsy Babich and Cecelia Thompson. Project No. 94-1001; The Pennsylvania State University.

SCRIPT FOR ENERGY CONSERVATION BOOKLET AND TAPE

(for placement in the learning center; see page 27)

Too much. Too fast. Too wasteful. That's how we are using energy, and we are just now beginning to pay the price. Because of gasoline shortages, severe weather, a blackout, and a few brownouts, we have been forced to reduce our use of energy. However, the extent to which we are willing to give up using energy is limited.

Unfortunate circumstances have occurred which have dramatically decreased interest in conservation. It has led some people to question whether there is an energy problem at all. For example, in several areas consumers were pleaded with to conserve, and what was the result? Suppliers had to raise prices because the public was using less. There seems to be plenty of gasoline now that the price has increased substantially. It is no wonder that many people do not yet believe that there is a problem.

Regardless of what it may seem, we do have a serious problem and the longer we wait to face it, the more critical it becomes. Since 1973 the United States has steadily increased oil imports. If we import over half our oil, we can obviously expect gasoline and other fuel costs to increase.

WHY CONSERVE?

Using our energy more efficiently and with as little waste as possible can help us immediately. But more important, conservation can save us money now and year after year. Just adding insulation to a poorly insulated home and sealing air leaks can save at least half the annual heating cost. There are many do-it-yourself activities to help you save energy, and save money.

ENERGY SOURCES

Some energy sources such as oil and gas are dwindling fast. We have a good supply of coal, but there are many technological problems to solve before it can be mined and burned without damage to the environment. We are simply finding less and less oil and gas in the United States, and that means we must rely more heavily on imports or switch to other sources of energy such as coal, nuclear, solar, and wind. Switching takes time and a great deal of money for research and development.

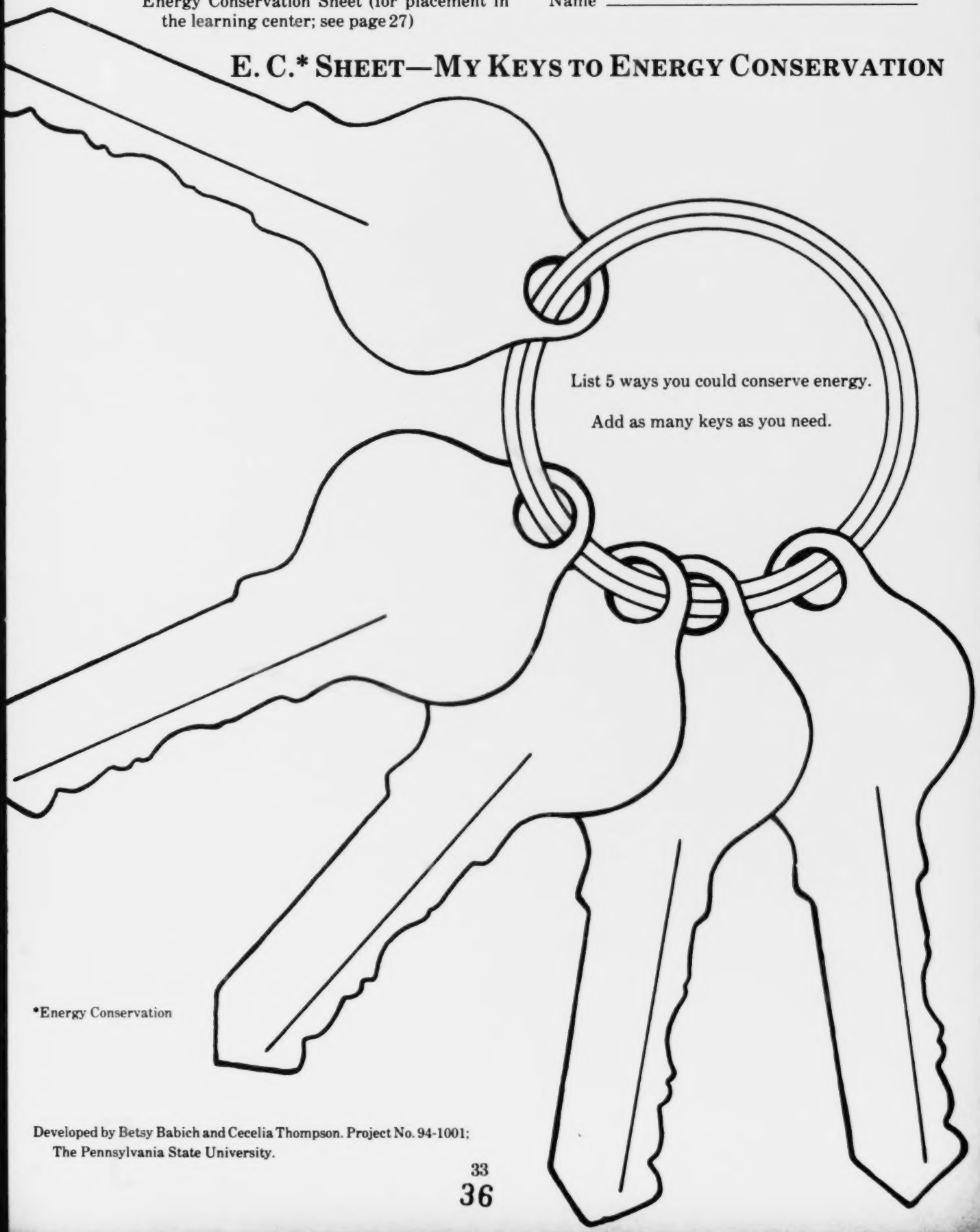
One of the first things you can do, as one individual, to conserve energy is to begin at home. Things like turning down the thermostat in winter and up in summer will save enormous amounts of energy and money. Taking cooler showers, running the dishwasher once a day, carpooling or walking, and remembering to turn lights off are things that you can begin to do immediately. What are some other things you can do to conserve energy? You may wish to take a poll of your friends, family, and neighbors and develop a list of things that can be done.

Adapted from: Howell, D. L. *Energy Conservation in the Home and on the Farm.* Teacher Education Series, Vol. 19, No. 4: Penn State University, 1978.

Energy Conservation Sheet (for placement in the learning center; see page 27)

Name _____

E. C.* Sheet—My Keys to Energy Conservation



*Energy Conservation

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MILEAGE COMPARISON CHART

(for placement in the learning center; see page 27)

Make of Car	Model	Year	Estimated Miles Per Gallon	Type of Gasoline	Estimated Cost of Gas	Cost to Drive 100 miles

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ENERGY FLASH CARDS

(for placement in the learning center; see page 27)

Directions: The following represent statments concerning energy conservation. For use in the learning center, place each statement on a separate 3 x 5 card. These will provide additional information for learner use when completing the activities in the learning center.

Open your refrigerator and freezer doors as few times as possible so you don't let the cold air escape.

Wait to accumulate a full load before running the dishwasher. You will save electricity and water.

Repair leaking faucets promptly. A leak of 1 drop per second adds up to 2400 gallons a year—a waste of electricity and water.

Make sure furniture and draperies are not blocking heating and cooling outlets.

During summer, close drapes during the day and open them at night to lower cooling costs.

Switch off television, radio, and stereo when no one is listening.

During the winter, close draperies during the night and open them during the day on the sunny side of your home.

A shower generally uses about one-half as much water as a tub bath.

Flourescent lamps produce four times as much light per watt as does the typical general service light bulb.

Cleaning the dryer's lint screen after each load will save electricity.

Drying clothes on the line uses no gas or electricity.

To save energy and have better looking hair, air-dry your hair.

Carpeting or area rugs offer insulating properties.

Use stairs instead of elevators whenever possible to save energy.

A 5000 pound car uses twice as much fuel as a 2,500 pound car.

Properly inflated auto tires provide better gas mileage.

A car pool saves gas and money as well as wear and tear on a car.

Bicycling and walking are efficient forms of personal transportation that use no gasoline.

Read a book instead of turning on the television.

Turn on only lights that you need in a room and turn them off when you leave.

Close outside doors quickly. Go in and out of buildings quickly and close the door behind you. It takes a lot of energy to heat and cool a building.

When you wash the dishes, don't let the water run.

Decide what you want from the refrigerator before you open the door.

Teach younger brothers and sisters the "whys" and "hows" of energy conservation.

Wash your clothes in cold water to save energy.

Sew a tube and stuff it to stop the drafts under your door at night. During the day, hand it over the door knob.

Open the diswasher just as it enters the dry cycle. This will release lots of steam and heat into the kitchen. The humidity will make you feel warmer. It will cut down on electricity used by the dishwasher, too.

Adapted from: "Conservation Tips for the Home." West Penn Power Company: Greensburg, PA. 15601. 1974.

Date _____

LEARNER CONTRACT SHEET

(for placement in the learning center; see page 27)

A) The activity (or activities) that I have chosen in order to reach objective #3 is (are)

B) The things I will need to do in order to complete the activities are

C) The special materials that I will need are

D) Proposed completion date is

E) I describe the success of my activity (activities) as

_____ Learner Signature

_____ Teacher Signature

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Name _____

PASS-REVIEW
Final Student Assessment

(for placement in the learning center; see page 27)

1. List three alternative sources of energy.

   1.

   2.

   3.

2. Which fossil fuel is in shortest supply?
   a. coal
   b. natural gas
   c. geothermal
   d. oil

3. Which of the following energy sources has the greatest potential to help meet our energy needs for the longest period of time?
   a. coal
   b. natural gas
   c. oil
   d. solar

4. Which of the following accounts for nearly one-half of all energy consumed in the United States?
   a. transportation
   b. processing
   c. cooking
   d. heating and air conditioning

5. What proportion of the world's energy is consumed by the 6% of the world's population residing in the U.S.A.?
   a. one-fourth
   b. one-third
   c. one-half
   d. three-fourths

6. The greatest obstacle in the use of coal as an energy source is
   a. cost
   b. mining and engineering
   c. pollution
   d. public acceptance

7. Usable energy from inside the earth's crust is called _____.
   a. geothermal
   b. geometric
   c. volcanic
   d. geology

8. Which of the following is the greatest energy user in the home?
   a. cooking and washing
   b. electrical appliances
   c. hot water heater
   d. space heating and cooling

9. List three ways to conserve energy in the home.

   1.

   2.

   3.

10. Sue's mother and Bill's father each work ten miles away from their homes. In a five-day week, each uses five gallons of gas driving to and from work. Bill's father drives alone. Sue's mother is in a car pool in which she takes four other persons to work. If each of her passengers drove, each would also ue five gallons of gas a week. By riding in a car pool, how much gas does Sue's mother help save each week?

    In one week she helps save _____ gallons of gasoline.

    In one year she helps save _____ gallons of gasoline.

    How could Bill's father help save energy?

Student Evaluation of Learning Center

This is how I felt about the learning center:

Great Good OK Poor Awful

Another way that I could have learned the material in this center is _____

_____ .

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Answer Sheets for E.Q. Sheet, E.C. Sheet, and Pass Review

E.Q. Sheet

1. over 1/3
2. transportation
3. coal
   oil
   natural gas
   nuclear
4. natural gas
5. pollution
6. all
7. treated from heated rocks or molten magma in the interior of the earth, that is transferred to the surface as heated water or steam.
8. windmills
9. water power
   waste
   chemical
10. watched T.V. — 2.01
    air conditioner —31.80
    refrigerator —10.60
    microwave oven— 1.50

    total—45.91

E.C. Sheet

See Energy Flash Cards for ideas.

Pass-Review

1. windmill
   water power
   chemical
   solar
   geothermal
   wastes
2. natural gas
3. coal
4. transportation
5. one-third
6. pollution
7. geothermal
8. space heating and cooling
9. (see Energy Flash Cards)
10. 20 gallons
    1040 gallons
    form a car pool

Concluding Statement

Centers can be used to present new information, or reinforce information already presented. They can develop a skill, provide enrichment and quest activities, or give opportunities to pursue a special interest. Centers can be used one at a time or in conjunction with many other centers, employing a management system that provides for sequential development.

The use of a learning center is only one strategy in the whole process of personalized education. If used as a part of the total educational process it can open new doors for learners to develop and practice self-management of learning.

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